MULTIFUNCTIONAL TELEMARK BOOT

The present invention refers to a multifunctional telemark boot.

Telemark boots of a well known kind, such as, for example, the boot 1 which is illustrated in the drawing marked "Prior Art", are suitable for permitting a flex in correspondence to an articulation of the metatarsus phalange of the foot, and they comprise: a shell 2 for housing the foot; a standard sole 3 - which is integral with the shell 2, and which is made up of a heel 4 and a toe 5 which are separated from each other by an insole arch 6; and a flexible articulation, which is part of the shell 2, and which is arranged substantially in correspondence with the toe 5 in order to permit the flex of the shell 2 itself.

The kinds of boots which have just been described above have a great disadvantage in that they may only be used for the telemark sport.

The aim of the present invention is to produce a multifunctional telemark boot, which will be free of the disadvantage described above.

According to the present invention, a multifunctional telemark boot will be produced comprising a shell; a sole which is integral with

the shell, and which is made up of a heel and a toe; and a flexible articulation which is part of the shell, and which is arranged substantially in correspondence with the toe in order to permit a flex of the shell itself; the telemark boot being characterised by the fact that it comprises stiffening means which are associated with the sole in order to selectively impede the said flex and to configure the telemark boot itself for different uses other than telemark.

The invention will now be described with reference to the attached drawings, which illustrate a non-limiting form of embodiment, and in which:

- FIGURE 1 is an elevated side view of a first preferred from of embodiment of a multifunctional telemark boot according to the present invention;

- FIGURES 1a and 1b are perspective views, on a reduced scale, of respective preferred alternative forms of embodiment of a detail of the boot illustrated in FIGURE 1;

- FIGURE 2 is an elevated side view of a second preferred form of embodiment of the multifunctional telemark boot shown in FIGURE 1;

- FIGURE 3 is an elevated side view of a third preferred form of embodiment of the multifunctional

telemark boot shown in FIGURE 1;

- FIGURE 4 shows, on an enlarged scale and with some parts removed for reasons of clarity, respective preferred alternative forms of embodiment of a detail of the boot shown in FIGURE 3; and

- FIGURES 5-14 show, in perspective views and with some parts removed for reasons of clarity, respective preferred alternative forms of embodiment of a detail of the boot shown in FIGURE 1.

With initial reference to FIGURE 1, and using the same reference numbers to indicate the same or similar parts which have already been described in the introduction to the description, the number 10 indicates, in its entirety, a multifunctional telemark boot made of plastic material, and comprising a shell 2 which is suitable for housing a foot inside it; a raised sole 13 which is integral with the shell 2, and which is made up of a heel 4 and a toe 5 which are separated from each other by an insole arch; and a flexible articulation 7, which is part of the shell 2, and which is arranged substantially in correspondence to the toe 5 in order to permit a flex of the shell 2 itself.

The boot 10 also comprises a stiffening device 11 which is associated with the sole 13 in order to

selectively impede the flex and to configure the boot 10 itself for different uses other than telemark such as, for example, alpine ski-ing, downhill ski-ing, snowboarding, backcountry ski-ing or mountain climbing.

In the form of embodiment which is illustrated in FIGURE 1, the stiffening device 11 is defined by the raised sole 13, which presents a thickness which is substantially the double of a thickness of a standard sole measured in correspondence with the opposite free ends of the standard sole itself, or rather in correspondence with the ends of the sole which interacts with the attachment devices of boots of a well known kind and with well known kinds of equipment for snow sports.

The raised sole 13 is made up of an external layer 13a made of rubber material, and an internal layer 13b made of plastic material, and, as is better illustrated in FIGURES 1a and 1b, it presents, in plan view, various forms which are adaptable to as many respective attachment devices for different kinds of snow sports. In particular, the very thickness of the sole 13 creates the adaptability of the boot 10 to various different kinds of snow sports and it can also present (FIGURE

1a) a toe 5a with an elongated form which is adaptable for telemark and alpine ski-ing and for downhill ski-ing in general, or (FIGURE 1b) a toe 5b with a widened form which is particularly usable for telemark or for alpine ski-ing performed with telemark attachment devices.

As an alternative to what has just been described, the thickness of the sole 13 can be determined by increasing the thickness of a standard sole by at least 50% as described above, and such an increase concerns only the portion 13b and not the portion 13a, or rather it concerns only the more rigid part of the sole 13 itself.

The heel 4 of the sole 13 is frontally delimited by a substantially flat surface 4a, which faces the insole arch 6, and which is inclined at an angle of substantially less than 70° in relation to a flat support surface of the boot 10.

Both the heel 4 and the toe 5 comprise respective free ends 4k and 5k, which extend outside the outline of the shell 2 in order to interface with the above-mentioned attachment devices, and they present respective undercuts 4s and 5s which have a thickness which is equal to the thickness of a standard sole and, thus, a thickness which is less

that the thickness of the sole 13.

In the case that the boot 10 should be used for snowboarding, the heel 4 and the toe 5 are not provided with the free ends 4k and 5k, so that the use of so-called "soft" attachment devices may be permitted.

In the form of embodiment which is illustrated in FIGURE 2, the stiffening device 11 comprises a compartment 14 which is obtained inside the toe 5, and a number of blades 15 which are arranged inside the compartment 14 itself and which may be orientated from an operating position which is coplanar to the sole 13 to an operating position which is transverse to the sole 13 itself in order to stiffen the shell 2 further. The blades 15 are joined to each other at their own respective ends by means of a blocking bracket 16, which is arranged inside the compartment 14, and a socket head screw 17 which is arranged in such a way as to close the compartment 14 and which faces the outside in correspondence to the insole arch 6.

The stiffening device 11 also comprises a spring 18, which is elastically compressed between an annular projection 19 which is obtained inside the compartment 14 and the bracket 16, and is

suitable for permitting the regulation of the extension of the blades 15 while they are being orientated. In particular, when a setscrew wrench 17a is used on the socket head screw 17, it is possible to orientate the blades 15 between the two above-mentioned operating positions, increasing or decreasing the flexion stiffness of the blades 15 themselves, and, consequently, increasing or decreasing the flexion stiffness of the shell 2.

The alternative forms of embodiment which are illustrated in FIGURES 3 to 10 relate to as many alternative forms of stiffening devices 11, each of which comprises a respective selectively interchangeable portion 20 of the raised sole 13 and which may be associated, according to specific needs, either with the toe 5 or the heel 4 or with both of them, and a respective constraining device 21 for constraining the portion 20 to the shell 2. Each of the devices 11 differs from the other devices 11 due to the different ways of producing the portion 20 and the relative device 21.

In the form of embodiment which is illustrated in FIGURES 3 and 4, the selectively interchangeable portion 20 of the raised sole 13 is defined by a moulded layer 31 which extends along the whole

length of the toe 5 starting from the insole arch 6, while the device 21 comprises a shaped pin 32 and a snap hook 33 both of which are integral with the layer 31, and of which the pin 32 may be inserted inside a respective housing 34 which is obtained through the end 5k of the toe 5, while the hook 33 may be inserted into the toe 5 itself from the side of the insole arch 6.

The device 21 also comprises an elastic stopping element 35 which is arranged substantially inside the housing 34 in order to block the shaped pin 32, and a blocking screw 36 which is associated with the hook 33 in order to selectively block the hook 33 itself to the toe 5. In particular, the elastic element 35 is defined by a sphere 37, which is transversely mobile in relation to the pin 32 due to the action of a spring 38, and which can be engaged in a respective notch 39 which is obtained on the edge of the pin 32 itself.

Finally, the device 21 comprises a release pin 40 which is arranged in the housing 34 opposite the sphere 37 in relation to the pin 32 in order to act on the sphere 37 in such a way as to free the pin 32 and to permit the unhooking and replacement of the portion 20.

In the form of embodiment which is illustrated in FIGURES 5 and 6, the selectively interchangeable portion 20 of the raised sole 13 is defined by an insert 51 which either extends for the whole length of the toe 5 or for the whole length of the heel 4, while the constraining device 21 comprises from one (FIGURE 5) to three shaped tracks 52 (FIGURE 6), which present a T shape in a section which is transverse to a longitudinal axis A of the sole 13, and which extend along the axis A itself.

The device 21 also comprises, for each track 52, a respective groove 53, which presents a shape which is complementary to the shape of the track 52 itself, and which is obtained in the insert 51 in order to permit the insertion and extraction of the insert 51 itself parallel to the axis A. Finally, the device 21 comprises, at least for the insert 51 which may be associated with the toe 5, a blocking wall 54 which is arranged transverse to the longitudinal axis A, and which is suitable for axially blocking the sliding movement of the insert 51 itself.

In the form of embodiment which is illustrated in FIGURES 7, 8, and 9, the selectively interchangeable portion 20 of the raised sole 13 is

defined by an insert 71 which either extends for the whole length of the toe 5 or for the whole length of the heel 4, while the device 21 comprises two shaped tracks 72, which extend along an axis B which is perpendicular to the axis A, and which present, as will be better described below, a reversed T shape. The device 21 also comprises, for each track 72, a groove 73, which presents a shape which is complementary to the shape of the relative track 72, and which is obtained in the insert 71 in order to permit the insertion or extraction of the insert 71 itself transverse to the axis A.

Finally, the device 21 comprises a pair of shaped fasteners 74 which are associated with each of the tracks 72 in order to block any reciprocal sliding between the track 72 itself and the relative groove 73.

The tracks 72 and the relative grooves 73 which are illustrated in FIGURES 7, 8, and 9 substantially differ from each other due to the conformation of the said tracks 72, and, consequently, of the grooves 73. In particular, the tracks 72 which are illustrated in FIGURE 7 comprise a head 72a which presents, in a section which is transverse to the axis B, a crown section shape; the tracks 72 which

are illustrated in FIGURE 8 comprise a head 72b which presents, in a section which is transverse to the axis B, an oblong cylindrical shape in a horizontal direction; while the tracks 72 which are illustrated in FIGURE 9 comprise a head 72c which presents, in a section which is transverse to the B axis, a regular cylindrical shape. Consequently, the grooves 73 and the fasteners 74 present gradually different shapes in order to adapt themselves to the external shape of the tracks 72 which have just been described. In any case, the presence of the fasteners 74 and their determined shape permits the production of various different kinds of heads which can be matched with similar types of grooves 73.

In the form of embodiment which is illustrated in FIGURE 10, the selectively interchangeable portion 20 of the raised sole 13 is defined by an insert 101 which either extends for the whole length of the toe 5 or for the whole length of the heel 4, while the device 21 comprises three pins with shaped heads 102, which are integral with and transverse to the insert 101, and which are arranged according to the points of an isosceles triangle in such a way that two of these, indicated with the number 102b,

are at the same distance from one pin itself, indicated with the number 102a. The device 21 also comprises a housing 103 and a groove with a shaped base 104, which are obtained in the shell 2, and of which the housing 103 is suitable for housing the pin 102a, while the groove 104 is of a substantially circular shape with a curve which is equal to one side of the above-mentioned triangle, and which is suitable for housing the pins 102b.

In this case, the coupling of the insert 101 to the shell 2 occurs by initially inserting the pin 102a into the housing 103, and then rotating the insert 101 itself around the pin 102a itself in such a way as to block the pin 102a into the housing 103 and insert the pins 102b into the groove 104 by means of the same rotating movement.

According to a form of embodiment which is not illustrated here but which may be easily deduced from the drawing shown in FIGURE 10, the device 21 may be provided with a single pin 102 and, for reasons of precision, with a single pin 102a.

In the form of embodiment which is illustrated in FIGURE 11, the selectively interchangeable portion 20 of the raised sole 13 is defined by an insert 111 which extends either for the whole length of the toe

5 or for the whole length of the heel 4, while the device 21 comprises two pins with shaped heads 112, which are integral with and transverse to the sole 13, and which are arranged along the axis B. In particular, each pin 112 presents a cylindrical shank 113 which is integral with the sole 13, and a flat circular head 114 which is transverse to the shank 113.

The device 21 also comprises, for each pin 112, a housing 115 which is obtained in the insert 111, and which presents an undercut 116 which is suitable for housing the shank 113, and an opening 117 which is of sufficient dimensions to allow the passage of the relative head 114.

In this case, the coupling of the insert 111 to the shell 2 occurs by initially inserting the head 114 of each pin 112 through the relative opening 117, and then blocking each head 114 beneath the relative undercut 116.

In the form of embodiment which is illustrated in FIGURE 12, the selectively interchangeable portion 20 of the raised sole 13 is defined by an insert 121 which either extends for the whole length of the toe 5 or for the whole length of the heel 4, while the device 21 comprises two coupling hinges

122 for attaching the insert 121 to the shell 2. In particular, each hinge 122 is defined by three notches 123 which are obtained in the insert 121, by three projections 124 which are integral with the shell 2 and which may be inserted into the relative notches 123, and by a respective shaft 125 which may be inserted through the notches 123 and the projections 124 in order to constrain the notches 123 and the projections 124 themselves to each other in such a way as to block the insert 121 to the shell 2.

According to a form of embodiment which is not illustrated here, but which may easily be deduced from the above description, the notches 123 and the projections 124, instead of being associated with the insert 121 and, respectively, the shell 2, may otherwise be associated with, respectively, the shell 2 and the insert 121.

The form of embodiment which is illustrated in FIGURE 13 shows a toe 5 which is also provided with an anchoring lip 131 in order to permit an improved anchoring of the external layer 13a to the internal layer 13b. The lip 131 is integral with the internal layer 13b in order to be inserted into a window 132 which is obtained through the external

layer 13a, and it comprises an anterior prismatic portion 133 and a posterior prismatic portion 134, which presents a triangular transverse section, and which tapers towards the portion 133 in such a way as to form, with the portion 133, an anchoring compartment 135 which is open towards the window 132.

In accordance with the necessities imposed by different applications, the lip 131 can be sized in such a way as to be flush with the layer 13a or in such a way as to have at least the portion 133 arranged so as to project outside the window 132 in relation to the layer 13a itself. The portion 133 can also present, in plan view, a shape which is as rectangular as trapezoid, just as the portion 134 can present a dovetail transverse section in order to define a notch (which is not illustrated) which is open towards the compartment 135 in order to anchor a rampant, or a crampon for providing improved grip on ice.

In the form of embodiment which is illustrated in FIGURE 14, the flexible articulation 7 is defined by a bellows 141 which is arranged on the upper part of the shell 2, and the stiffening device 11 also comprises a regulating lever 142 for blocking the

foot inside the shell 2. The lever 142 is mounted in rotating fashion on the shell 2 in correspondence to the bellows 141, and two anchoring pins 143 are arranged inside the shell 2 itself in correspondence with the toe 5 and lateral to the toe 5 itself, and a shock absorber pin 144 is arranged through the shell 2 opposite the lever 142 in relation to the bellows 141.

Finally, the device 11 comprises two stay rods 145, each of which connects a relative pin 143 to the lever 142 and which is turned in a U formation around the pin 144 in order to pass laterally and inside the toe 5 and beneath the bellows 141. In particular, the pin 144 presents an internal plate 146 and an external spring 147 and is suitable for absorbing the pull on the stay rods 145 as a result of the reduction of the mobility of the bellows 141 due to the regulating effect of the lever 142 on the bellows 141 itself.

In a form of embodiment which is not illustrated, the lever 142 may be mounted on the free end of a tension hook which is in turn mounted astride the bellows 141 in order to permit both the regulation of the blocking action of the foot inside the shell 2 by means of rotating the lever 142 in

relation to the tension hook, and a selective regulation of the stiffness of the bellows 141 by means of the same tension hook.

It is intended that the present invention should not be limited to the forms of embodiment which are herein described and illustrated, which are to be considered as forms of embodiment of the multifunctional telemark boot, which might be subject to further modifications regarding the shape and disposition of its parts, as well as to details pertaining to construction and assembly.